

Review for Test

1.1-1.8

Name _____ Date _____ Period _____

Describe the end behavior of each polynomial using limits.

1. $f(x) = (x+3)(x-1)(2x-5)$

2. $f(x) = -(x+4)^2(x-2)$

$\lim_{x \rightarrow -\infty} f(x) =$ $\lim_{x \rightarrow +\infty} f(x) =$

$\lim_{x \rightarrow -\infty} f(x) =$ $\lim_{x \rightarrow +\infty} f(x) =$

3. $f(x) = -2x^3 - 3x^2 + 36x - 58$

4. $f(x) = 3x^4 - 7x^3 + 16x^2 - 15x + 65$

$\lim_{x \rightarrow -\infty} f(x) =$ $\lim_{x \rightarrow +\infty} f(x) =$

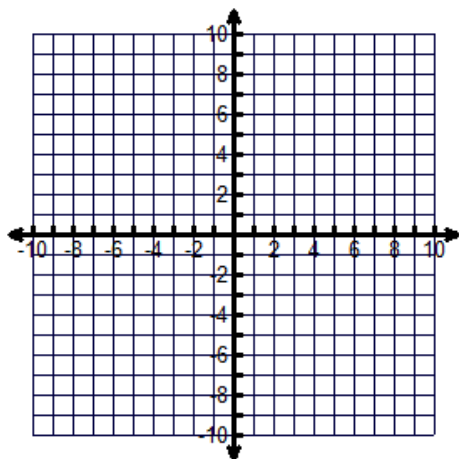
$\lim_{x \rightarrow -\infty} f(x) =$ $\lim_{x \rightarrow +\infty} f(x) =$

State the degree and list the zeros of the polynomial. State the multiplicity of each zero and determine whether the graph crosses or touches the x-axis at the corresponding x-intercept. Then sketch a graph.

5. $f(x) = -2x^3(x+8)$ Degree: _____

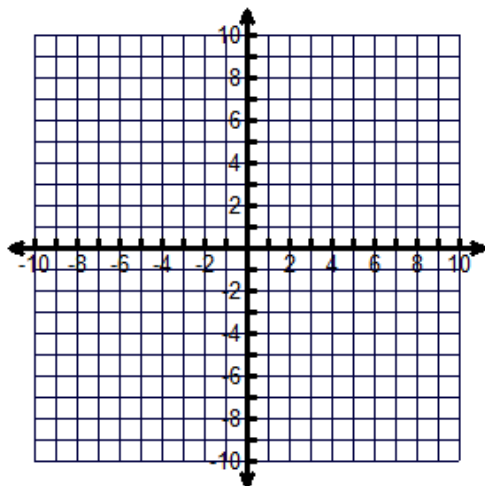
Zero	Multiplicity	Touch/Cross

$\lim_{x \rightarrow -\infty} f(x) =$ $\lim_{x \rightarrow +\infty} f(x) =$



6. $f(x) = (x+1)^2(x-5)^3(x+3)^2$ Degree: _____

Zero	Multiplicity	Touch/Cross



$$\lim_{x \rightarrow -\infty} f(x) =$$

$$\lim_{x \rightarrow +\infty} f(x) =$$

Multiply the expression using the polynomial identities.

7. $(3x+2y)^2$

8. $(x-2y)^3$

9. $(x-4)(x+6)$

10. $(5x+i)(5x-i)$

Factor the expressions using the polynomial identities.

11. $16x^2 - 49$

12. $x^3 + 125$

13. $x^2 - 4x - 21$

14. $9x^2 + 81$

Use the quadratic formula to solve each equation. Show work!

15. $x^2 - 17x = -72$

16. $5x^2 - 3x + 1 = 0$

Simplify the expression. Show work!

17. $(x+5)(2x-1)-(3x^2-16x+3)$

Divide $f(x)$ by $d(x)$ using long division. Write answer in fraction form. According to the Factor Theorem, is $d(x)$ a factor of $f(x)$? Show work!

18. $f(x) = 2x^3 - 3x^2 + 4x - 8$, $d(x) = x - 1$ Yes or No

Divide using synthetic division. Write answer in fraction form. Show work!

19.
$$\frac{2x^3 + 3x^2 + 4x - 10}{x + 1}$$

20. **Given $2x^3 + x^2 - 5x + 2$, which of the following is a factor? Show work!**

a) $x + 3$

b) $x - 1$

c) $x + 2$

Use the Remainder Theorem to find the remainder when $f(x)$ is divided by $x - k$. Show work!

21. $f(x) = 2x^3 - 5x + 3$, $k = -3$

Use the Rational Zeros Theorem to write a list of all potential rational zeros. Show work!

22. $f(x) = 3x^3 + 43x^2 + 43x + 27$

Using the given zero, find all of the zeros and write a factored form of $f(x)$. Show work!

23. $3i$, is a zero of $f(x) = x^4 - x^3 + 7x^2 - 9x - 18$

Write a polynomial function of minimum degree in standard form with real coefficients whose zeros include those listed. Show work!

24. -2 and $1 + 2i$

Write a polynomial function of minimum degree in factored form with real coefficients whose zeros include those listed. Show work!

25. 1 (multiplicity 2), -2 (multiplicity 3)